

Disco 341 Wafer Dicing Saw Users Manual



Coral name: Dicing Saw
Model: Disco 341
Location: NanoFab Post Processing Lab, Building 215
Contact: nanofab_postprocess@nist.gov
Version: 1.0

Start up

- Check tool utilities on back wall. Turn on if required.
- Turn key-switch to START, and release to the ON position.
- Initialize system by selecting the INIT SYS key on the keypad.

Setup

This is used to determine the amount of remaining blade exposure. This is used if you do not know if the blade has enough cutting material exposed to cut to the desired depth, or to cut completely through the sample.

- Press the SETUP key on the keypad and follow onscreen instructions.
- Do not change parameters:

RPM = 19000,
O.D = blade diameter (entered by technician during blade change)
8" chuck
Universal type

Hairline Adjust

This is performed to align the blade and optics system. It ensures that the blade will cut exactly where you place the optical hairlines. It is highly recommended for accurate cutting.

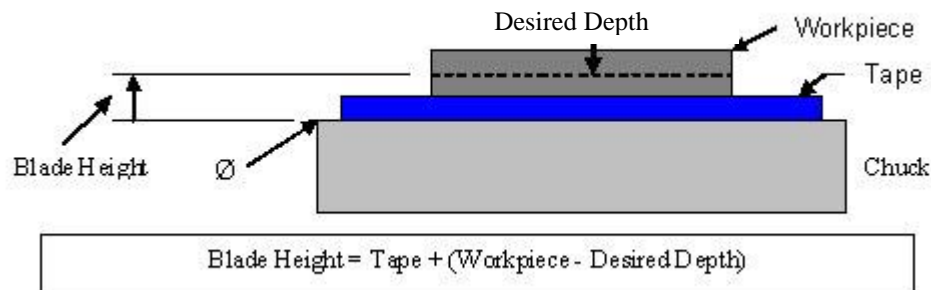
- Select the Hair Adjust program from the device data list.
- Measure wafer thickness with micrometer.
- Enter thickness into device data work thickness data slot.
- Enter "0.00000" for tape thickness.
- Enter wafer diameter into device data round workpiece data slot. Add 1/2 inch to the diameter to give a buffer zone so that the blade does not hit the sample in its way down.
- Set Blade Height to ½ workpiece thickness. This way backing tape is not required. Note: all depth measurements are taken from the chuck, up. This ensures that you never cut into the chuck. Enter ½ work piece thickness into the Blade height data slot.
- Set Feed speed to 1 in/sec or less for silicon wafer cutting. When using a resinoid blade, set feed speed much slower, to about 0.1 in/sec or slower if the sample is thicker than a conventional silicon wafer (250-600 microns).
- Save and exit the device data list.
- Enter Semi auto cut mode F2.
- Make a couple of cuts into the wafer, then press the START/STOP key to pause cutting. Look at the position of the cut on the screen. If it does not align with the optical hairlines, adjust the Y position so that the cut and hairlines line up in the same position.
- Press "F1-Hair Adj" from menu. If your last key stroke was not towards the rear of the machine, you will get a warning. All keystrokes are referenced toward the rear of the machine. Press Y once forward, then press Y once toward the rear (this is the Y key with the underline). This will keep your hairline and cut in the desired position, but the last keystroke made will be towards the rear of the machine. Then press F1 again to perform the hairline adjustment.

- Make a couple more cuts and observe them. If the cut and hairline are still in alignment after cutting, you can exit the cutting mode. Otherwise repeat the above steps until the adjustment is correct.

Cutting

There are two cutting modes, Auto and Semi-auto. Auto is fast and can be used to cut samples with known Ch-1 and Ch-2 dimensions. Semi-auto is cut friendly. It is used to make one cut passes, or cuts at different locations. In semi mode, the tool cuts exactly where you place the optical hairlines, and provides the number of cuts that the user pre-selects. Auto mode cuts both Ch-1 and Ch-2 automatically based on preset conditions. Semi-auto cuts Ch-1 and Ch-2 independently, and Ch-2 must be manually selected.

- Through-the-wafer cutting requires backing tape.
- Apply backing tape to sample.
 - Blue tape is 0.003"
 - Black tape is 0.005"
- Remove air bubbles from the back of sample with finger or flat applicator.
- Enter appropriate data into the device data list (i.e. thickness, RPM, feed speed, Blade Height*, etc.)
 - *Blade height is a measurement from the chuck up to your cut depth.



- Select cut mode F1 or F2.
- In cut mode you can measure F8, Align F4/F5, Select cut direction F5/F10, and other features.
- After sample has been aligned (see instructions below) cutting can begin.
- Select cut direction. Press the START/STOP key. For pausing the cutting press the START/STOP key again, press one more time to resume cutting.
- If a blade breaks during cutting, pause the tool, and call the Facility Technician x2096.
- If a sample gets caught in the blade, press the EMO button. That is the Emergency Manual Off button. Then contact facility Technician.

Align

You can use the θ Key to rotate sample, or you can use the auto-align feature. The auto-align feature uses 70% of the entered sample size for alignment reference points. Entering the alignment mode allows the user to select the first alignment point (straight line feature, edge of sample, flat on wafer, etc.). The system then moves to a second point 70% away from the first, the user then selects the second alignment point and presses F5 to activate the alignment.

- In auto mode select F5-Align. Follow the onscreen instructions.
- In Semi-auto mode select F4, then F5 and follow the onscreen instructions.
- Press the white ENTER key after alignment is complete.

Measure - F8

Measure is a caliper type feature.

- Enter Measure mode, press F8
- Position the hairline at the first reference point.
- Zero the counter, press F3.
- Move the hairline to the next point that you want to measure to. The distance is displayed in the counter window at the top right of the screen.
- This data can be entered into the device data list for Ch-1 and Ch-2 by moving the cursor to the Y-index and pressing F4-Index set, then press F5-Device set. Or you can write down the measurement and type it directly into the device data list.

Extra Options

The Disco 341 offers other features not noted in this instructions to keep things simple. If you require special cutting capabilities (channels, troughs, ramps, etc.), please see the Facility Technician before beginning any work outside the norm.